

1. (Amended) A golf ball comprising:
  - a core, wherein the core comprises at least one layer formed of a homogeneous composition comprising at least one rubber, a metal salt of an  $\alpha,\beta$ -unsaturated acid, an initiator, and at least one thermoplastic material having a Vicat-softening temperature of at least about 38° C; and
  - an inner cover disposed about the core; and an outer cover disposed about the inner cover.
12. (Amended) The golf ball of claim 1, wherein the inner cover comprises at least one material selected from the group consisting of ionomers, thermoplastic or thermoset polyurethanes, polyetheresters, polyetheramides, or polyesters, dynamically vulcanized elastomers, functionalized styrene-butadiene elastomers, metallocene polymers, polyamides, acrylonitrile butadiene-styrene copolymers (ABS), and blends thereof.
15. (Amended) A golf ball comprising:
  - a core comprising at least two layers, wherein at least one of the core layers is formed of a homogeneous composition comprising at least one rubber, a metal salt of an  $\alpha,\beta$ -unsaturated acid, an initiator, and at least one thermoplastic material having a Vicat-softening temperature of at least about 38°C; and
  - an inner cover disposed about the core; and
  - an outer cover disposed about the inner cover.
26. (Amended) The golf ball of claim 15, wherein the inner cover comprises at least one material selected from the group consisting of ionomers, thermoplastic or thermoset polyurethanes, polyetheresters, polyetheramides, or polyesters, dynamically vulcanized elastomers, functionalized styrene-butadiene elastomers, metallocene polymers, polyamides, acrylonitrile butadiene-styrene copolymers (ABS), and blends thereof.
29. (Amended) A method of forming a golf ball comprising:
  - forming a first mixture comprising at least one rubber and at least one thermoplastic material;
  - mixing said first mixture at a first temperature sufficient to allow substantially homogeneous mixing of said first mixture;
  - cooling said first mixture to a second temperature;

forming a second mixture by adding the first mixture to a free-radical initiator having an activation temperature at a temperature above the second temperature;

shaping and heating the second mixture to at least the activation temperature to crosslink the second mixture so as to form a portion of a golf ball core;

forming an inner cover disposed about the golf ball core; and

forming an outer cover thereon.